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09/729,748	12/04/2000	Charles Razzell	US008073	7523

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EXAMINER

FAN, CHIEH M

ART UNIT

PAPER NUMBER

2634

DATE MAILED: 07/21/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/729,748

Applicant(s)

RAZZELL, CHARLES

Examiner

Chieh M Fan

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 10 May 2004.  
2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.  
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-20 is/are pending in the application.  
4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.  
6) ☒ Claim(s) 1,8-12,19 and 20 is/are rejected.  
7) ☒ Claim(s) 2-7 and 13-18 is/are objected to.  
8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.  
10) ☒ The drawing(s) filed on 04 December 2000 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

**DETAILED ACTION**

***Claim Rejections - 35 USC § 102***

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1, 8-12, 19 and 20 are rejected under 35 U.S.C. 102(b) as being anticipated by Lee et al. ("Normalization, windowing and quantization of soft-decision Viterbi decoder inputs in CDMA", IEEE 1999 Vehicular Technology Conference, pp.221-225, provided by the applicant in the IDS filed 8/13/02, USPTO Paper#3).

Regarding claims 1 and 12, Lee et al. teach a method of demodulating and decoding an encoded interleaved signal, said method comprising:

demodulating a received encoded interleaved signal thereby producing soft-decision demodulated output words (page 221, right column, lines 3-5 from the bottom; also see lines 2-3 in abstract);

de-interleaving and scaling said soft-decision demodulated output words thereby producing de-interleaved and scaled words, said scaling being performed for a plurality of successively demodulated output words at a time, thereby applying scaling factors that have substantially the same value for adjacent demodulated output words of said plurality of successively demodulated output words, said de-interleaved and scaled

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words being word-length-reduced words; (See page 221, right column, lines 1-3 from the bottom; lines 6-13 in the abstract. Also see page 222 the whole section III, that is, the received symbols are normalized by a normalization factor  $m$ . Also note that since the data are encoded by convolutional code and interleaved before transmitted, see Fig. 1 and the first paragraph of section II, it is inherent/implicit that the received data must be de-interleaved before sent to the Viterbi decoder.) and

decoding said de-interleaved and scaled words (page 222, left column, lines 1-3; lines 11-13 in abstract; also see page 221, left column, lines 6-7 from the bottom).

Regarding claims 8 and 19, Lee et al. teach a rake receiver (lines 1-2 of the abstract).

Regarding claims 9, 10 and 20, Lee et al. teach a Viterbi decoder (lines 6-8 of the abstract).

Regarding claim 11, Lee et al. teach that the received encoded interleaved signal is convolutional encoded (see Fig. 1, also see Section II, lines 6-7 in the first paragraph).

### ***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1, 8-12, 19 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Li et al. (U.S. Patent No. 6,621,850) in view of the admitted prior art described in pages 2-3 of the present application.

Regarding claims 1 and 12, Li et al. teach a method of demodulating and decoding an encoded interleaved signal, said method comprising:

demodulating a received encoded interleaved signal thereby producing soft-decision demodulated output words (310,320,330,505,540 in Fig. 2, also note 545 in Fig. 2 is the soft decision data, see col. 6, line 54);

de-interleaving said soft-decision demodulated output words thereby producing de-interleaved words; (550 in Fig. 2.) and

decoding said de-interleaved words (560 in Fig. 2).

Li et al. fail to teach the step of scaling the soft decision demodulated output words and applying scaling factors that have substantially the same value for successively demodulated output words.

However, the admitted prior art as described in pages 2, line 25 through page 3, line 6 of the present application teaches that soft decision scaling and quantization methods in digital receivers are known that reduce the amount of memory and the complexity of the arithmetic in the receiver, as part of Viterbi forward error correction algorithm (page 2, lines 25-28). The admitted prior art also teaches known methods of scaling include application of a fixed scaling factor (page 2, line 32 through page 3, line1).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to incorporate the step of scaling the soft-decision demodulated output words into the demodulating method of Li et al., so as to reduce the amount of memory and the complexity of the arithmetic in the receiver of Li et al.

Regarding claims 8 and 19, Li et al. teach a rake receiver (320 in Fig. 2; col. 4, line 46).

Regarding claims 9, 10 and 20, Li et al. teach a Viterbi decoder (560 in Fig. 2; col. 7, line 2).

Regarding claim 11, Li et al. teach that the received encoded interleaved signal is convolutional encoded (see 150, 170 in Fig. 1, also see col. 10, line 65).

### ***Allowable Subject Matter***

5. Claims 2-7 and 13-18 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

### ***Response to Arguments***

6. Applicant's arguments filed 5/10/04 have been fully considered but they are not persuasive.

a. With respect to the Lee reference, the applicant argues that Lee does not teach “scaling factors that have substantially the same value for adjacent demodulated output words of said successively demodulated output words” because the method taught by Lee for determining normalization or scale factors based on a current frame may vary substantially from one frame to the next.

Examiner’s response --- The applicant only recites “substantially the same”, but never defines what degree of similarity is called “substantially the same” in the claim. The applicant is reminded that the examiner is entitled to give the broadest reasonable interpretation to the language of the claims. The examiner is not limited to the applicant’s definition which is not specifically set forth in the claims. See *In re Tanaka et al.*, 193 USPQ 139, (CCPA) 1977. In the present application, if the scaling factors determined from Figs 4 and 5 of the present application may be called “substantially the same”, the scaling factors determined from the method of Lee clearly may also be called “substantially the same”. Especially in Fig. 5 of the present application, the amplitude data from one frame (which may vary substantially from one frame to the next) is used to determine the scaling factor of the next frame.

b. With respect to the Li reference in view of the admitted prior art Stelle, the applicant argues that neither of Li and Stelle teaches “scaling factors that have substantially the same value for adjacent demodulated output words of said successively demodulated output words”.

Examiner’s response --- The applicant is again reminded that the degree of similarity to be called “substantially the same” is never defined in the claim. As shown

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in Fig. 4 of the present application, the scaling factor SF applied is  $0.7 \times SF$ ,  $1.4 \times SF$  or SF. That is, according to the specification, anything between  $0.7SF$  to  $1.4SF$  is called "substantially the same" scaling factor. Since the fixed scaling factor taught by Stelle falls within such range, the teaching of Stelle clearly meets the claimed limitation.

Further, although Stelle teaches applying fixed scaling factors, it is understood in the art the scaling factors cannot be expected to be exactly the same due to inherent noise in the system. Based on the reason above, the teaching of Stelle meets the limitation "scaling factors that have substantially the same value for adjacent demodulated output words of said successively demodulated output words".

c. The applicant further argues that the combination of Li and Stelle would have no reasonable expectation of success to develop the novel feature of the present invention because the fixed scaling factors taught by Stelle "is prone to loss of information due to underflow and overflow".

Examiner's response --- The examiner proposes combining the teachings of Li and Stelle to meet the claimed limitation, not to develop the novel feature of the present invention. Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993). Further, the examiner proposed to combine the Li and Stelle references for the advantage of reducing the amount of memory and the complexity of the arithmetic in the receiver. Such advantage is clearly achievable. The combination of Li and Stelle clearly has reasonable expectation of success.



***Conclusion***

7. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Chieh M Fan whose telephone number is (703) 305-0198. The examiner can normally be reached on Monday-Friday 8:00AM-5:30PM, Alternate Fridays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen Chin can be reached on (703) 305-4714. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9314 for regular communications and (703) 872-9314 for After Final communications.

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-4750.



Chieh M Fan  
Primary Examiner  
Art Unit 2634

cmf  
July 12, 2004